

KHLEUVEN

KATHOLIEKE HOGESCHOOL LEUVEN

Associatie Katholieke Universiteit Leuven

BEED 2008

Economic valuation of nature reserves

Case-study: Meldertbos

29 • 02 • 08

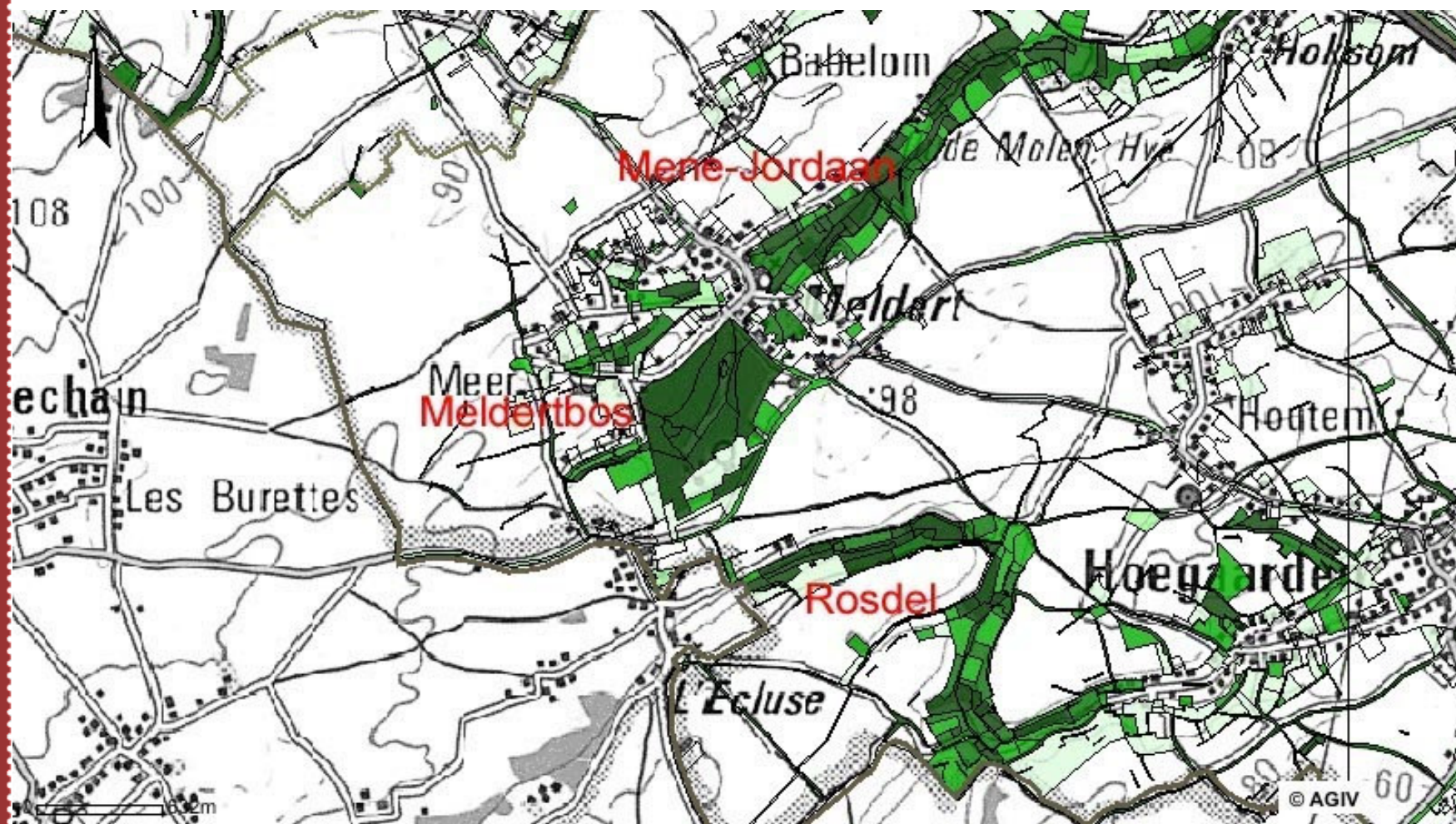
- ➔ 1. Introduction
- ➔ 2. Meldertbos
- ➔ 3. Recreational value
- ➔ 4. Non-use value
- ➔ 5. Ecosystem functions
- ➔ 6. Conclusions

- ➔ Values & valuation
- ➔ Economic valuation of nature: pro and contra
 - “You can’t put a price on nature”
 - “Nature and environment are not free goods”
- ➔ Elements of economic valuation
 - Recreational value → travel cost method
 - Non-use value → contingent valuation methods, e.g. choice modelling
 - Ecosystem functions value → benefit transfer, shadow project methods

- ➔ 1. Introduction
- ➔ **2. Meldertbos**
- ➔ 3. Recreational value
- ➔ 4. Non-use value
- ➔ 5. Ecosystem functions
- ➔ 6. Conclusions

- ➔ **Meldertbos**
- ➔ Historical park, ca 50ha
- ➔ Partly owned by Natuurpunt
- ➔ School
- ➔ History & culture
- ➔ Biodiversity





- ➔ 1. Introduction
- ➔ 2. Meldertbos
- ➔ **3. *Recreational value***
- ➔ 4. Non-use value
- ➔ 5. Ecosystem functions
- ➔ 6. Conclusions

- ➔ Travel cost method
 - Willingness to pay
 - Out-of-pocket costs
 - Consumer surplus
- ➔ Questionnaire (112 respondents)
 - Travelled distance
 - Frequency of & reasons for visits
 - Substitutes
 - Socio-demographic data
- ➔ Visitor profile
 - Average age 36 years
 - Higher education
 - An average of 5,5 visits per year

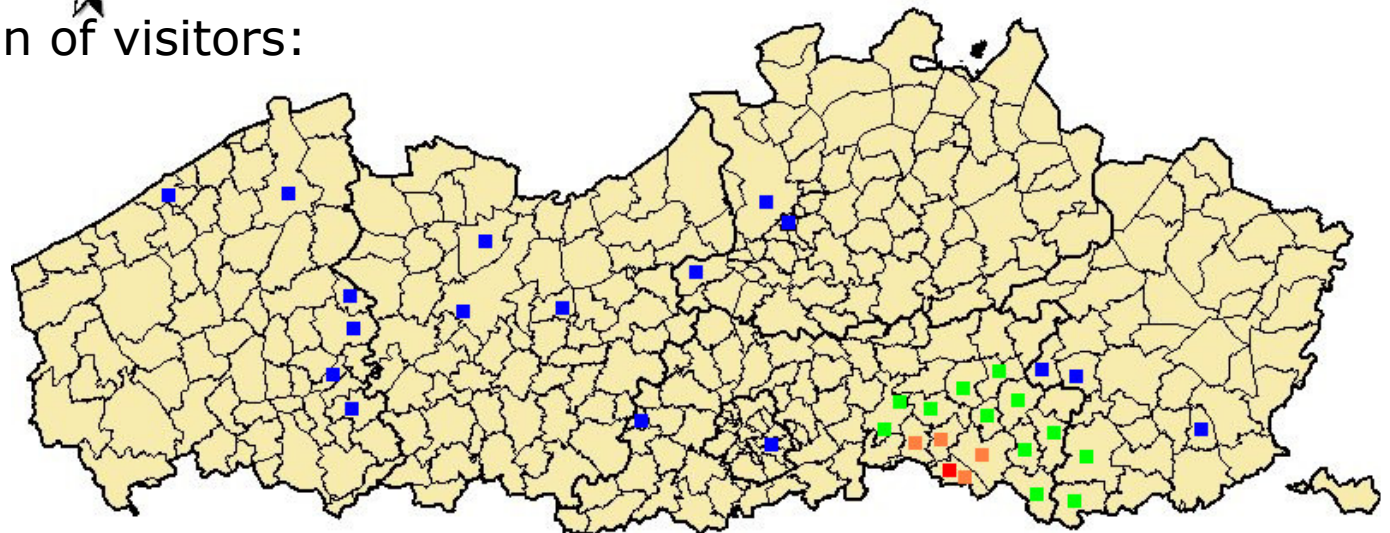
➔ Reasons for visit:

- To walk, to relax, enjoy, study and photograph nature
- Frequently combined with other activities

➔ Average distance travelled:

- By car: 41,40 km
- By bike: 13,60 km
- On foot: 1,77 km

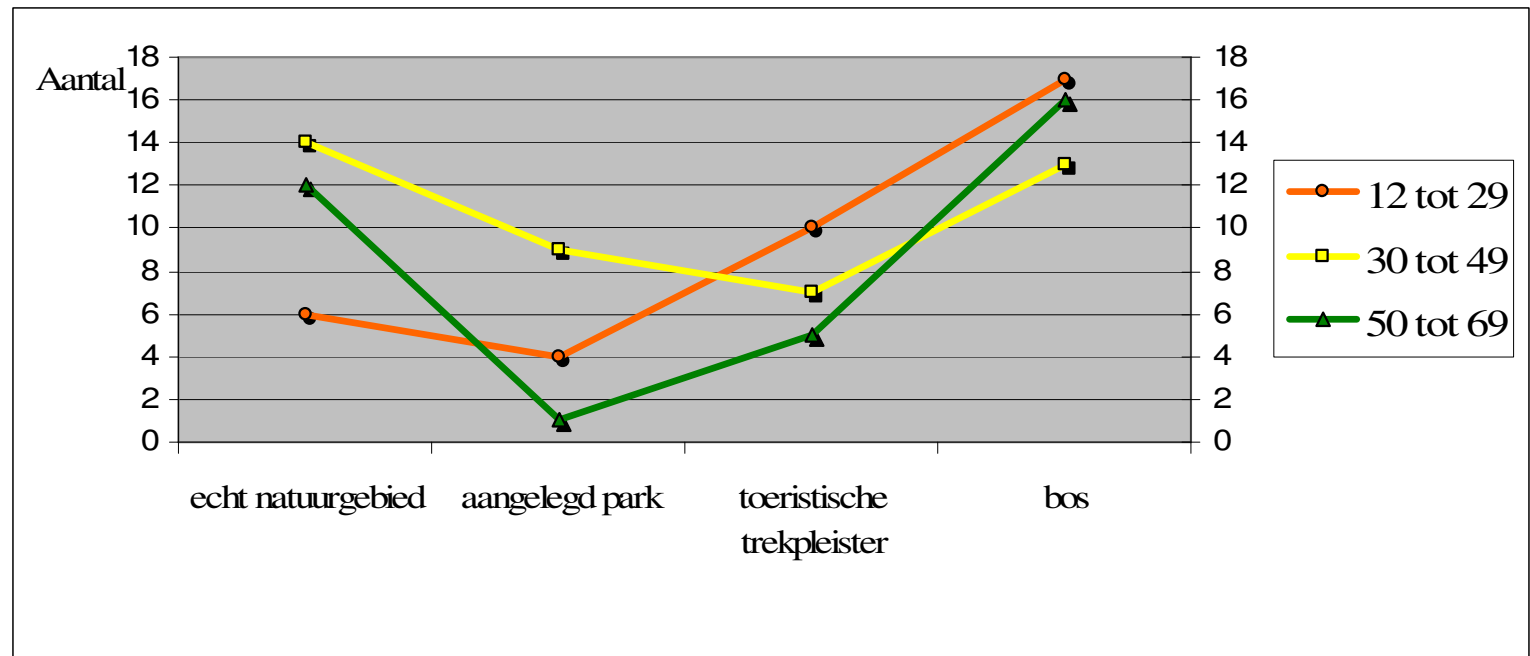
➔ Origin of visitors:



➔ Substitutes – four types

- « Real » nature reserve
- Artificial park
- Touristical attraction
- Forest

➔ Perception: difference according to age



➞ Estimation of the consumer surplus

- Travelled distance + frequency of visits
- Regression analysis
- Value per visit between € 0,66 en 3

➞ Total annual recreational value

- Estimation of number of visitors
- € 66.000 – 300.000

➞ Net present value

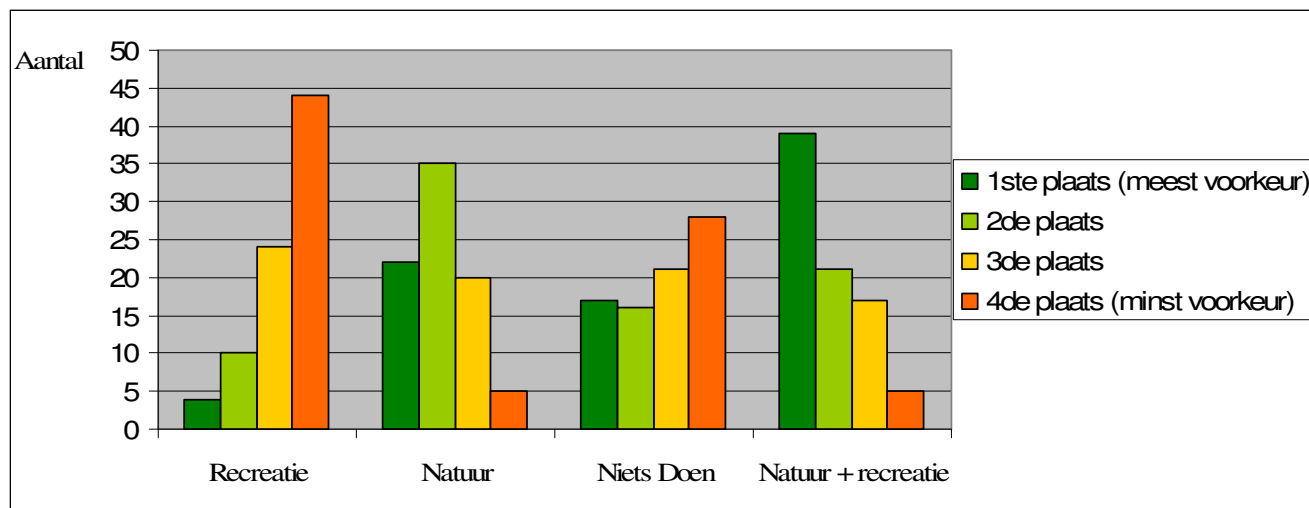
- Meldertbos will provide this recreational value for years to come
- € 1,3 – 6 million

- ➔ 1. Introduction
- ➔ 2. Meldertbos
- ➔ 3. Recreational value
- ➔ **4. *Non-use value***
- ➔ 5. Ecosystem functions
- ➔ 6. Conclusions

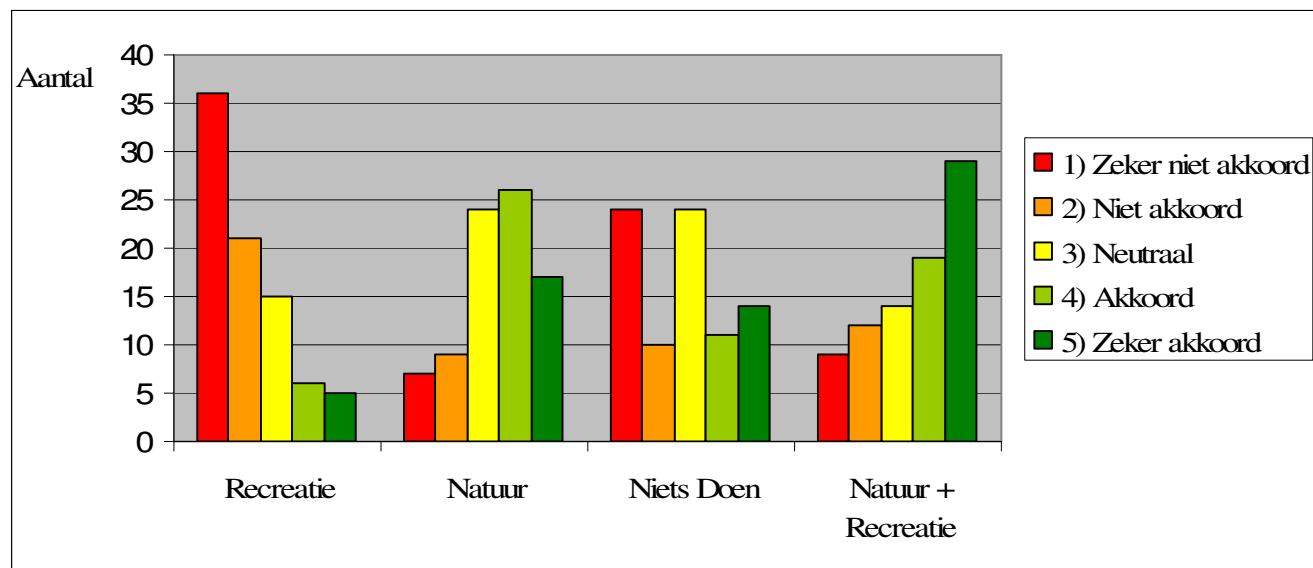
- ➔ Existence value & bequest value
- ➔ Choice modelling - Four scenarios:
 - 'recreation'
 - 'nature'
 - 'do nothing'
 - 'nature & recreation'
- ➔ Ranking
- ➔ Rate between 1 and 5

4. Non-use value

➔ Ranking:



➔ Rating:



- ➔ Scenario 'recreation' is least popular
- ➔ Scenario 'nature & recreation' is most popular
- ➔ No significant correlation between choice and socio-demographic data
- ➔ Weak negative correlation between rating of scenario 'nature' and being member of environmental organisation
- ➔ Willingness to pay
 - 'recreation' 0,48 euro
 - 'nature' 0,73 euro
 - 'nature & recreation' 1,40 euro

- ➔ Extrapolation of willingness to pay
- ➔ Three scale levels
 - Hoegaarden
 - District of Leuven
 - Flanders
- ➔ Non-use value between € 1.100 and € 3,5 million
 - District Leuven € 270.000

	Hoegaarden	Arrondissement Leuven	Vlaams Gewest
Scenario 'recreatie'	1 165,92	92 558,40	1 192 061,76
Scenario 'natuur'	1 773,17	140 765,90	1 812 927,26
Scenario 'natuur + recreatie'	3 400,60	269 962,00	3 476 846,80

- ➔ 1. Introduction
- ➔ 2. Meldertbos
- ➔ 3. Recreational value
- ➔ 4. Non-use value
- ➔ **5. *Ecosystem functions***
- ➔ 6. Conclusions

- ➔ CO₂-fixation
 - Value of total fixed carbon: € 1,8 million
 - Value of annual fixation: € 32.000
- ➔ Absorption of pollution
 - Annual value of approximately: € 1.000
- ➔ Groundwater purification
 - Shadow project € 2.500 - 22.500
- ➔ Soil retention
 - Benefit transfer € 30.000
- ➔ Nutrient cycles
 - Replacement cost € 3.400 - 820.000
- ➔ Absorption of noise
 - Fixed value between: € 34.000 - 300.000
 - Annual value between: € 13.000 - 67.000

➔ Biodiversity

- Very hard to « count »
- Based on regulation: € 50.000
- Based on funding: € 5.600 - 67.000

➔ Educational aspects

- Annual value of education: € 18.000

➔ Production of food and raw materials

- Hunting and wood production is forbidden
- Valuation to make a comparison
- Total annual value: € 12.000

➔ **Net present value of ecosystem functions**

- Hard to compare
- Per ecosystem function value between: € 21.500 - € 16,5 million

5. Ecosystem functions

ECOSYSTEEMFUNCTIE	WAARDE MELDERTBOS (in €/jaar)	NETTO ACTUELE WAARDE (in €)
Klimaatregeling		
CO ₂ -stockage	32 025,00	640 500,00
Polluentenabsorptie	1 075,00	21 500,00
Waterzuivering	2 500,00 – 22 500,00	50 000,00 – 450 000,00
Bodembehoud	29 250,00	585 000,00
Nutriëntencycli	3 400,00 – 820 650,00	68 000,00 – 16 413 000,00
Geluidsabsorptie	13 230,00 – 67 410,00	264 600,00 – 1 348 200,00
Biodiversiteit	5 637,00 – 66 808,00	112 740,00 – 1 336 150,00
Educatieve aspecten	17 850,00	357 000,00

- ➔ 1. Introduction
- ➔ 2. Meldertbos
- ➔ 3. Recreational value
- ➔ 4. Non-use value
- ➔ 5. Ecosystem functions
- ➔ **6. Conclusions**

➔ Recreational value

- Annual recreational value: € 66.000 - 300.000
- Net present value: € 1.3 - 6 million
- Out of pocket costs?

➔ Non-use value

- Between € 1.100 - € 3,5 million
- Estimated (District Leuven) € 270.000

➔ Ecosystem functions value

- Between € 1.000 - 820.000
- Net present value: up to € 16.5 million

➔ ***Limitations of the study:***

- ➔ Study conducted between October 2005 – August 2006
 - 10 months
 - Questionnaire only during winter / early spring
- ➔ Simplification of methods

➔ ***General conclusions:***

- ➔ Although it is an estimation, it is a good indication of the value
- ➔ Ecosystem functions are hard to calculate, however it is clear that their value is much higher than recreational and non-use value
- ➔ Hard to compare different values → need for uniformity
- ➔ Need for further research on valuation of ecosystem functions (e.g. biodiversity)

➞ Thanks for your attention!

➞ Wim Lambrechts

wim.lambrechts@khleuven.be